

MAR 23 2007

REMARKS/ARGUMENTS

In view of the foregoing amendments and the following remarks, the applicants respectfully submit that the pending claims comply with 35 U.S.C. § 112, comply with 35 U.S.C. § 101, are not anticipated under 35 U.S.C. § 102 and are not rendered obvious under 35 U.S.C. § 103. Accordingly, it is believed that this application is in condition for allowance. If, however, the Examiner believes that there are any unresolved issues, or believes that some or all of the claims are not in condition for allowance, the applicants respectfully request that the Examiner contact the undersigned to schedule a telephone Examiner Interview before any further actions on the merits.

The applicants will now address each of the issues raised in the outstanding Office Action.

Objections

Claim 51 is objected to because it depends on itself. Claim 51 has been amended to depend from claim 50. Accordingly, this objection should be withdrawn.

Rejections under 35 U.S.C. § 112

Claims 46, 47, 49 and 52 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the

invention. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Claim 46 has been amended to provide proper antecedent basis for various terms and to clarify the claim. Accordingly, the applicants respectfully request that the Examiner reconsider and withdraw this rejection.

The Examiner found that claim 47 recited various terms that lacked proper antecedent basis. Specifically, the Examiner found that "the candidate search result" recited on lines 6-7 and 11 lacks sufficient antecedent basis. This claim has been amended to provide proper antecedent basis. It has also been amended to clarify what was meant by "that" in line 11, and "the two candidate search results." Accordingly, the applicants respectfully request that the Examiner reconsider and withdraw this rejection.

The Examiner found claim 49 to recite a negative limitation since it recites the word "not." First, MPEP 2173.05(i) provides, "there is nothing inherently ambiguous or uncertain about a negative limitation. So long as the boundaries of the patent protection sought are set forth definitely, albeit negatively, the claim complies with the requirements of 35 U.S.C. 112, second paragraph." The boundaries of the claim are clear. Furthermore, as used in the claim, the word "not" does not recite a negative limitation. Specifically, the claim recites "determining whether or not the two documents are near-duplicate documents" and "determining whether or not any one of the at least two fingerprints of a first of the two documents matches any one of the at least two fingerprints of a second of the two documents".

In both instances, there is a determination act which is not a negative limitation. Frankly, the applicants cannot see how "determining whether or not ..." is any less proper than "determination whether..." Accordingly, the applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Finally, the Examiner found claim 52 to recite a negative limitation since it recites the word "not." Claim 52 has been amended to recite "wherein at least some contiguous elements in a document are not contiguous elements of a list." This is not a negative limitation because it further defines features of at least some contiguous elements in a document. Accordingly, the applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Rejections under 35 U.S.C. § 101

Claims 46-67 are rejected under 35 U.S.C. § 101 because the claimed invention is purportedly directed to non-statutory subject matter. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The applicants respectfully disagree with the Examiner's conclusion since the claims produce concrete, useful and tangible results. Specifically, as the specification states:

As can be appreciated from the foregoing, improved near-duplicate detection techniques are disclosed. These near-duplicate detection

techniques are **robust, and reduce processing and storage requirements. Such reduced processing and storage requirements is particularly important when processing large document collections.**

The near-duplicate detection techniques have a number of important **practical applications.** In the context of a search engine for example, these techniques can be used during a crawling operation to speed-up the crawling and to save bandwidth by not crawling near-duplicate Web pages or sites, as determined from documents uncovered in a previous crawl. Further, **by reducing the number of Web pages or sites crawled, these techniques can be used to reduce storage requirements of a repository, and therefore, other downstream stored data structures.** These techniques can instead be used later, in response to a query, in which case **a user is not annoyed with near-duplicate search results.** These techniques may also be used to "fix" broken links. That is, if a document (e.g., a Web page) doesn't exist (at a particular location or URL) anymore, a link to a near-duplicate page can be provided. [Emphasis added.]

Page 43, line 13 through page 44, line 3. Thus, the invention has real-world value.

Independent method claim 46 has been amended to further recite that a filtered set of search results including only those of the plurality of candidate search results that have not been rejected is defined. Independent claim 47 has been similarly amended. As can be appreciated from the foregoing, these claims now

clearly generate a concrete, useful and tangible result. Consequently, claims 46 and 47 now recite statutory subject matter.

Independent claim 49 has been amended to further recite using the determination of whether or not the two documents are near-duplicates in at least one of (A) an act of serving search results corresponding to documents, (B) an act of crawling documents, (C) an act of indexing documents, and (D) an act of fixing a broken link to at least one of the two documents. These useful, concrete and tangible results are described in the specification at page 18, lines 14-31. As can be appreciated from the foregoing, these claims now clearly generate a concrete, useful and tangible result. Thus, claim 49 now recites statutory subject matter.

Independent claims 48, 50, 52, 53 and 67 recite machine-readable medium storing various data structures. As was the case in In re. Lowry, 32 U.S.P.Q.2d 1031 (Fed. Cir. 1994), these claims are more than a mere abstraction -- the claimed data structures are specific structural elements in memory. Further, they provide tangible benefits. Specifically, embodiments consistent with the present invention may detect near-duplicate documents by (i) for each document, generating fingerprints, (ii) preprocessing (optionally) the fingerprints to eliminate those that only occur in one document, and (iii) determining near-duplicate documents based on the (remaining) fingerprints. The act of generating fingerprints for each document may be effected by (i) extracting parts (e.g., words) from the documents, (ii)

hashing each of the extracted parts to determine which of a predetermined number of lists is to be populated with a given part, and (iii) for each of the lists, generating a fingerprint. The claims recite the lists formed from elements of a document. Fingerprints generated from these lists allow duplicate documents to be found using less time, processing and memory than at least one other technique. Hence, the claimed data structures clearly have a practical application. Thus, these claims are functional material recorded on a computer-readable medium. The Patent Office has recently instructed:

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

"Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility", OG Notices: 22 November 2005, Annex IV.

As can be appreciated from the foregoing, independent claims 48, 50, 52, 53 and 67 recite statutory subject matter. Since claims 55-57 depend from claim 48, since claims 51 and 58-60 depend from claim 50, since claims 61-63 depend from claim 52, and since claims 54 and 64-66 depend from claim 53, these claims also recite statutory subject matter.

Rejections under 35 U.S.C. § 102

Claim 49 is rejected under U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,119,124 ("the Broder patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Claim 49 is not anticipated by the Broder patent because the Broder patent does not teach concluding that two documents are near-duplicates if **any one** fingerprint of one of the documents matches **any one** fingerprint of the other document, **where each of the documents has at least two fingerprints.**

The Examiner contends that the Broder patent teaches this feature, citing column 10, lines 27-29. (See Paper No. 20061013, pages 7 and 8.) However, this section of the Broder patent concerns reducing computational workload by eliminating (1) identical documents and (2) equivalent documents such that a cluster of documents does not include identical or equivalent documents. The Broder patent does so by (1) fingerprinting the entire document (for purposes of identifying identical documents) and (2) fingerprinting a canonical form of the document and/or a set of shingles of a document (for purposes of identifying equivalent documents) so that if two documents with identical fingerprints are encountered, only one is used in the clustering process. After clustering is completed, the eliminated documents are added back in. (See, e.g., column 10, lines 12-30.)

As can be appreciated from the foregoing, the fingerprints of entire documents (or of a canonical form of a document or of a set of shingles of a document) are not used to conclude whether or not two documents are

near duplicates. Rather, they are used in an optimization technique applied during clustering. (See, e.g., column 9, lines 59 and 60.) More importantly, claim 49 recites that each of the documents includes **at least two** fingerprints. In the cited portion of the Broder patent, **single** fingerprints, representative of each document, are used to find identical (or lexically-equivalent or shingle-equivalent) documents. Thus, claim 49 is not anticipated by the Broder patent for at least the foregoing reasons.

Claims 50-54, 58-60, 61-63 and 64-66 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,850,490 ("the Johnson patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The Johnson patent is first introduced. The Johnson patent concerns storing and retrieving image information from scanned documents. As shown in Figure 5, different types of documents (different "document classes") can have different types of information (different "segment classes") at different positions. Referring to column 9, lines 24-27, a "class of documents" is a category (such as, for example, article, pleading, memorandum, etc.) to which a document may belong. Referring to column 9, lines 32-36, a "class of document segments" is a category (such as, for example, title, author, abstract, body, journal, date, sender, recipient, subject, plaintiff, defendant, court, etc.) to which a document segment may belong. Referring back to Figure 5, a schema 120 may be used to associate certain segment

classes 124, 126 (at certain positions 130, 134), with a certain document class 122.

Referring to Figures 10-12, a user may manually mark forms, to be scanned along with the document, in order to specify types of documents or document segments to be expected, as well as expected positions of the document segments. The scanned document image information may be stored as segment data, and may be associated with a document identifier and segment classes in either a list, as shown in Figure 15, or a table as shown in Figure 16.

Referring to Figure 16, image segments from a document may be stored in a table 450. Each table 450 pertains to a particular document class. Each row 452 of the table 450 corresponds to a particular scanned document belonging to the document particular document class. In each row, segment data is provided under a column corresponding to a segment class (of the particular document class). In the example of Figure 16, image data of a title segment, an author segment, a text segment, etc., is provided.

Information stored in tables, such as 450 of Figure 16, can be searched by first applying search constraints to the class of documents to find one or more tables, and then applying search constraints to class of document segments to find one more columns of the one or more tables. Finally, search constraints can be applied to the content of the one or more columns of the one or more tables. Upon finding an entry with a field that includes segment data satisfying all of the constraints, the corresponding document identifier can be obtained and used to access the document's image data.

As can be appreciated from the foregoing, the entries in the columns of the table 450 of Figure 16 include image segments of scanned documents, which are arranged based on segment class. The segment class columns contain different information ***from different documents***. That is, each row of the table corresponds to a different identified document.

Independent claims 50, 52 and 53 are not anticipated by the Johnson patent at least because the Johnson patent does not teach a ***plurality of lists***, each of the plurality of lists containing ***elements of a document*** identified by the document identifier stored in the first field. Rather, if it is the Examiner's position that the columns of the table 450 in the Johnson patent correspond to the claimed list, then each of these lists does not contain ***elements from a document***. Rather, they contain elements from different documents.

Therefore, claims 50, 52 and 53 are not anticipated by the Johnson patent for at least this reason. Since claims 51 and 58-60 depend from claim 50, since claims 61-63 depend from claim 52, and since claims 54 and 64-66 depend from claim 53, these claims are similarly not anticipated by the Johnson patent.

Rejections under 35 U.S.C. § 103

Claim 48 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Johnson patent, in view of U.S. Patent No. 6,381,601 ("the Fujiwara patent"). The applicants respectfully request that the Examiner

reconsider and withdraw this ground of rejection in view of the following.

Claim 48 is not rendered obvious by the Fujiwara and Johnson patents at least because (1) these patents neither teach, nor suggest, a plurality of lists, each of the plurality of lists containing elements of a document identified by the document identifier stored in the first field, wherein a hash function is used to hash each of the elements in order to determine which one of the plurality of lists that each of the elements will be contained in, and (2) one skilled in the art would not have been motivated to combine these patents as proposed by the Examiner.

First, as discussed above with reference to claims 50, 52 and 53, the columns of table 450 of the Johnson patent do not teach a **plurality of lists**, each of the plurality of lists containing **elements of a document** identified by the document identifier stored in the first field. The Examiner does not rely on the Fujiwara patent to compensate for this deficiency. Thus, the rejection of claim 48 is improper for at least this reason.

Second and more importantly, one skilled in the art would not have been motivated to combine the references as proposed by the Examiner. The Examiner concedes that the Johnson patent does to teach using a hash function to hash each of the elements (of a document stored in a table) to determine which of a plurality of lists that each of the elements will be contained in. In an attempt to compensate for this admitted deficiency in the Johnson patent, the Examiner relies on the Fujiwara patent as teaching using a hash function to hash elements in order to determine which of a plurality of lists each element

will be contained in. The Examiner then concludes, incorrectly, that it would have been obvious to one skilled in the art at the time of the invention to use a hash function to hash each of the elements in order to determine which of a plurality of lists that each element will be contained in "to reduce or remove duplicate elements by using a hash function." Paper No. 20061013, page 11. The applicants strongly disagree.

As mentioned above, in the table 450 of Figure 16 of the Johnson patent, each of the columns is associated with a different segment class. Recall that "class of document segments" is a category (such as, for example, title, author, abstract, body, journal, date, sender, recipient, subject, plaintiff, defendant, court, etc.) to which a document segment may belong. Thus, in the Johnson patent **document segments are placed in columns of the table 450 based on their segment class**. The search in Johnson utilizes this arrangement. Thus, it is believed that arranging documents segments into different columns of the table on the basis of a hashing function rather than on the basis of segment class would destroy important functionality in the Johnson patent. Therefore, one skilled in the art would not have been motivated to modify the Johnson patent as proposed by the Examiner. Consequently, claim 48 is not rendered obvious by the Johnson and Fujiwara patents for at least this additional reason.

Claims 48, 55-57 and 67 are rejected 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,360,215 ("the Judd patent"), in view of the Fujiwara patent. The applicants respectfully request that the

Examiner reconsider and withdraw this ground of rejection in view of the following.

As discussed by the Examiner, the Judd patent does include a "document index" record. As described in the Judd patent, the document index maps document identifiers to specific document location identifiers (e.g., URLs), or to other information that may be displayed after a search, such as a document title or abstract. (See, e.g., column 7, lines 5-9.) However, the discussion of using a hash function in column 7, lines 65 through column 8, line 9 in the Judd patent pertains to hashing words of a "word index." As described in the Judd patent, the word index includes an alphabetical list of words, each word being mapped to one or more document identifiers which identify documents including the word. (See, e.g., column 7, lines 1-5.) Thus, as the Examiner concedes, the Judd patent does not teach using a hash function to determine which of a plurality of lists that each of a number of document elements will be contained in. (See Paper No. 20061013, page 12.)

The Examiner alleges that column 7, lines 45-50 of the Judd patent teach a plurality of "lists" containing elements of a document (e.g., title, document summary, etc.) identified by a document identifier. (See Paper No. 20061013, page 11.) The cited section of the Judd patent states that each record of a document index may include a document identifier, a hashed value of the contents of the text of the document, and values of properties of the document. The applicants frankly fail to appreciate how any of these **elements** can be characterized as **lists**. If it is the Examiner's position that columns of the document index correspond to lists,

then these lists are not associated with a record associated with an identified document as claimed.

The Examiner relies on the Fujiwara patent as teaching the use of a hash function to hash elements in order to determine which of a plurality of lists that each element will be contained in, citing column 2, lines 57-62, column 4, lines 47-62 and column 5, line 50 through column 6, line 10. (See Paper No. 20061013, page 12.) The Examiner then concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to use a hash function to hash each of the elements *in order to determine which of a plurality of list that each element will be contained in* because this would somehow reduce or remove duplicate elements. (See Paper No. 20061013, page 12.) The applicants respectfully disagree.

As best understood by the applicants, the Fujiwara patent (1) determines plural database records having the same value for a particular column or particular columns, and (2) deletes duplicate records. (See, e.g., column 1, lines 5-9.) The cited operation of the Fujiwara patent differs substantially from the claimed invention. Specifically, the Fujiwara patent states:

... the step for determining possibility [or not for existence of at least another record having the identical value to that of at least a part of one or more predetermined columns of the records for each of plural records of the record list included in the database] includes the steps for generating a hash value *for each of plural records of record list included in the database with*

the hash function **using as an argument the value of at least a part of one or more predetermined columns** among those for the grouping of such records, determining whether at least another record having the hash value identical to that of the hash value generated for each record exists or not from a plurality of hash values generated for plural records, and also determining a part of plurality of records determined respectively that there is no other records having the identical hash values by such determination process as the records having no possibility that the other records having the identical value of at least a part of the columns among those for the grouping do not exist. [Emphasis added.]

Column 4, lines 45-60. More specifically, the Fujiwara patent states:

For each record, a hash value is generated (4) by the hash function `has1()` **using, as an argument, the value of hash column...** When one column G is used for the standard of grouping, the hash column H is identical to one column. When a plurality of columns G are used for the standard of grouping, the hash column H is identical to one column in a plurality of columns G or combination of a plurality of columns. [Emphasis added.]

Column 5, line 60 through column 6, line 3.

As can be appreciated from the foregoing, **the hash function is not used to determine a column in which an element of a document will belong** as claimed. Rather, a column or columns of a database record (to be used for

the standard of grouping) are hashed to generate a hash value **for the record**. Thus, even if the purported teaching of the Fujiwara patent were to be combined with the Judd patent, the combination still would neither teach, nor suggest, a data structure wherein a hash function is used to hash each of the elements to **determine which one of the plurality of lists that each of the elements will be contained in.**

Further, one skilled in the art would not have been motivated to combine these references as proposed by the Examiner. Specifically, in the Judd patent, in the document index, each record may include a document identifier and information extracted from the document. If it is the Examiner's position that a hash function is somehow to be used to determine what document identifier hash document information should belong to, the applicants respectfully submit that this would likely destroy functionality of the document index. If it is the Examiner's position that a hash function is somehow to be used to determine what document property (e.g., title, summary, etc.) an extracted value should be associated with, the applicants respectfully submit that one skilled in the art would not have been motivated to make this modification since doing so would clearly not make sense. Finally, the applicants fail to see how the modification proposed by the Examiner would reduce or remove duplicate documents as alleged.

Accordingly, independent claims 48 and 67 are not rendered obvious by the Judd and Fujiwara patents for at least the foregoing reasons. Since claims 55-57 depend from claim 48, these claims are similarly not rendered obvious.

Also, dependent claim 56 further recites that each of the elements of a document is a predetermined one of (A) a predetermined number of words, (B) a predetermined number of sentences, (C) a predetermined number of characters, (D) a predetermined number of paragraphs, and (E) a predetermined number of sections. The Examiner alleges that a document title or document summary teaches an element defined by a predetermined number of words or sentences. (See Paper No. 20061013, page 12.) Since, however, document titles and summaries are not confined to a predetermined number of words or sentences, the applicants respectfully submit that claim 56 further defines the claimed invention over the Judd and Fujiwara patents.

Also, dependent claim 57 further recites that each of the elements of a document partially overlaps another of the elements of the document. The Examiner alleges that column 7, lines 47-50 of the Judd patent teaches this feature. (See Paper No. 20061013, page 13.) The applicants respectfully request that the Examiner clarify her position since the cited section simply refers to document elements that may be provided in a document index.

Claims 50-54, 58-60, 61-63 and 64-66 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,873,982 ("the Bates patent"), in view of the Johnson patent. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

First, even assuming, arguendo, that one skilled in the art would have been motivated to combine these

references as proposed by the Examiner, the proposed combination neither teaches, nor suggests, a plurality of records, each of the records comprising (a) a first field for storing a document identifier; and (b) a plurality of lists, each of the plurality of lists containing elements of a document identified by the document identifier stored in the first field, wherein at least some of the plurality of lists include different numbers of elements, or wherein at least some contiguous elements in a document are not contiguous elements of a list, or wherein for each of the records, the number of lists is the same.

Specifically, as noted in the previous response, assuming, arguendo, that each of the keyword fields 106 of the Bates patent could be characterized as the claimed "lists", each of the keyword fields 106 does not contain **elements** of the document. Instead, each of the keyword fields 106 includes a **single word** of the document. Indeed, the Examiner now concedes this point. (See Paper No. 20061013, page 13.) To compensate for this deficiency of the Bates patent, the Examiner contends that the Johnson patent teaches a plurality of lists each containing elements of a document. However, as discussed above, the Johnson patent does not teach a **plurality of lists**, each of the plurality of lists containing elements of **a document** identified by the document identifier stored in the first field. Rather, if it is the Examiner's position that the columns of the table 450 in the Johnson patent correspond to the claimed list, then each of these lists does not contain elements from a document. Rather, they contain elements from different documents.

Thus, independent claims 50, 52 and 53 are not rendered obvious by the Bates and Johnson patents for at least this reason. Since claims 51 and 58-60 depend from claim 50, since claims 61-63 depend from claim 52 and since claims 54 and 64-66 depend from claim 53, these claims are similarly not rendered obvious by the Bates and Johnson patents.

Further, the Examiner has not demonstrated that one skilled in the art would have been motivated to combine the Bates and Johnson patents. Thus, the Examiner has not made a *prima facie* showing of obviousness. More specifically, the Examiner states:

It would have been obvious to one having ordinary skill in the art at the time of the invention... to have each of the plurality of lists containing more than one element of a document as suggested by Johnson **because the difference are [sic] only found in the nonfunctional descriptive material** and do not alter how the elements of [the] system function. Thus **this descriptive material will not distinguish the claimed invention from the prior art in terms of patentability.** [Emphasis added.]

Paper No. 20061013, page 14. The applicants respectfully submit that the Examiner has misapplied the cases cited.

Specifically, in In re. Gulack, 217 U.S.P.Q. 401 (Fed. Cir. 1983), the Court of Appeals reversed a rejection by the Board, finding that digits of Gulack's invention were functionally related to a band which acted as a substrate. Id., at 404. In any event, the Federal

Circuit further instructed that a specific type of functional relationship is not required, stating:

What is required is the existence of differences between the appealed claims and the prior art sufficient to establish patentability. The bare presence of absence of a specific functional relationship, without further analysis, is not dispositive of obviousness. Rather, the critical question is whether there exists any new and nonobvious functional relationship between the printed matter and the substrate.

Id. In In re. Lowry, 32 U.S.P.Q.2d 1031 (Fed. Cir. 1031), the Federal Circuit noted that Gulack cautioned against the liberal use of printed matter rejections under section 103, and stated:

... the Board erroneously extended a printed matter rejection under sections 102 and 103 to a new field in this case, which involves information stored in a memory.

Id., at 1034. The data structures claimed in Lowry were alleged to greatly facilitate data management by data processing systems, and the Federal Circuit reversed 102 and 103 based grounds of rejection. Similarly, in the instant application, the claimed data structures include lists formed from elements of a document. Fingerprints generated from these lists allow duplicate documents to be found using less time, processing and memory. Thus, the claimed lists are not non-functional descriptive material. (If the Examiner's test were applied, any

stored data structure could be rendered unpatentable by any other stored data structure which would clearly be improper.)

Thus, independent claims 50, 52 and 53 are not rendered obvious by the Bates and Johnson patents for at least this additional reason. Since claims 51 and 58-60 depend from claim 50, since claims 61-63 depend from claim 52 and since claims 54 and 64-66 depend from claim 53, these claims are similarly not rendered obvious by the Bates and Johnson patents.

Claims 48, 55, 56 and 67 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Bates patent, in view of the Johnson patent, and further in view of the Fujiwara patent. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

First, as just discussed above with reference to claims 50, 52 and 53, the Examiner has not demonstrated that one skilled in the art would have been motivated to combine the Bates and Johnson patents. Thus, the Examiner has not made a *prima facie* showing of obviousness. Consequently, independent claims 48 and 67 are patentable for at least this reason. Since claims 55 and 56 depend from claim 48, they are similarly patentable.

Second, as discussed above, in the Fujiwara patent, ***the hash function is not used to determine a column in which an element of a document will belong.*** Rather, a column or columns of a database record (to be used for the standard of grouping) are hashed to generate a hash value ***for the record.*** Thus, even if the purported

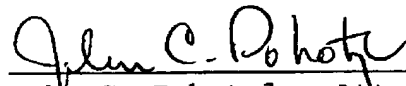
teaching of the Fujiwara patent were to be combined with the Bates and Johnson patents, the combination still would neither teach, nor suggest, a data structure wherein a hash function is used to hash each of the elements to determine which one of the plurality of lists that each of the elements will be contained in. Thus, claims 48 and 67 are patentable for at least this reason. Since claims 55 and 56 depend from claim 48, they are similarly patentable.

Conclusion

In view of the foregoing amendments and remarks, the applicant respectfully submits that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Respectfully submitted,

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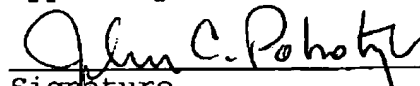

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